



## WILDLIFE MANAGEMENT

## AND RESEARCH NOTES

No.  1002	<b>AUTHOR:</b> W. Adam Phelps, Waterfowl Research Biologist	<b>DATE</b> 7/13/10
	<b>TITLE:</b> 2008-10 Late Canada Goose Zone Season Final Report	

**Abstract:** In July 2007, Indiana was granted an experimental late Canada goose season in thirty counties to target giant Canada geese (*Branta canadensis maxima*). To participate in the Late Canada Goose Zone Season, hunters must have a valid Indiana hunting license, Indiana and federal waterfowl stamps, HIP number, and a free permit. Each hunter is required to return a brief survey that is distributed with each permit. Permits were issued to 11,993 hunters over three years. Of these, an estimated 7,985 hunters participated in the three experimental seasons. Hunters checked in a total of 8,286 Canada geese during the experiment. Statewide harvest during the three experimental Late Canada Goose Zone Seasons is therefore estimated to be 15,806 Canada geese, of which 14,082 were giant Canada geese and 1,724 were other (mostly *B. c. interior*) geese. The estimated percent of giant Canada geese in the harvest during the special season was 89.1%. Indiana will be presenting a recommendation to the Mississippi Flyway Council that this season be allowed to go operational as of the 2010-2011 waterfowl hunting season.

### Introduction

In July 2007, Indiana was granted an experimental late Canada goose season in thirty counties. The experiment period includes the 2007-08 through 2009-10 waterfowl seasons. This season is intended to target giant Canada geese (*Branta canadensis maxima*) in and around urban areas. At the end of the experiment period, if Indiana is able to show the US Fish and Wildlife Service (USFWS) that at least 80% of the harvest was made up of giant Canada geese, then Indiana can ask that the season be granted operational status, which no longer requires evaluation (permits, checking birds).

The season runs from 1 – 15 February. Shooting hours are ½ hour before sunrise to sunset with a bag limit of 5 per day. The counties included are Elkhart, LaPorte, Marshall, St. Joseph, Starke (South Bend), Adams, Allen, Dekalb, Huntington, Kosciusko, Lagrange, Noble, Steuben, Wells, Whitley (Ft. Wayne), Boone, Hamilton, Hancock, Hendricks, Johnson, Madison, Marion, Morgan, Shelby (Indianapolis), Clay, Greene, Parke, Sullivan, Vermillion, and Vigo (Terre Haute).

### Methods

To participate in the Late Canada Goose Zone Season, hunters must have a valid Indiana hunting license, Indiana and federal waterfowl stamps, HIP number, and a free permit. Each hunter is required to return a brief survey that is distributed with each permit.

Hunters are required to check in every goose killed during this season. Birds must be checked in within 48 hours of kill or by 1500 on 15 February, whichever is sooner. Check station staff age each bird. Each adult is sexed and its head removed. Each head is tagged with date and county of kill and sex of the bird. Heads are then frozen and transported to the Bloomington field office, where skull and culmen lengths are measured.

Adult skull measurements adults were used in the algebraic proportioning formula of Trost et al. (1992) to determine the proportion of giant Canada geese in the harvest. Baseline mean skull lengths of 132.8mm for giant males, 124.8mm for giant females, 121.1mm for *B. c. interior* males, and 113.8mm for *B. c. interior* females, were derived from Moser and Rolley (1990).

Due to bias issues with using only one sex (see Discussion for more), proportions were determined for both sexes, then averaged to obtain a final estimate. This averaging was accomplished by

$$\frac{(\# \text{ males} \times \% \text{ giant}) + (\# \text{ females} \times \% \text{ giant})}{(\# \text{ males} + \# \text{ females})}$$

When the method of Trost et al. (1992) produced estimates of greater than 100% giants (see Discussion for more), the “% giant” in the averaging equation was set to “100%”.

Morphometric data were analyzed at the Zone level (all 30 counties together), at the region level, and by five-day segments. In addition, band returns for Canada geese harvested in Indiana during the experimental season were obtained from the Game Bird Data (USGS 2010). Banding data were used with the harvest derivations (Moser 2010) to estimate percentages of the February harvest originating in different jurisdictions.

## **Results**

Permits were issued to 11,993 hunters across all three seasons. Of these, 5,939 (49.5%) returned the attached survey. Of these, 3,955 (67%) reported hunting Canada geese during the late season. Based on this, an estimated 7,985 hunters participated in the three experimental seasons.

Hunters checked in a total of 8,286 Canada geese during the late seasons. Of these, 4,643 were adults (2,377 male, 2,266 female), 3,011 juveniles, and 628 of unknown age. Hunters reported not checking 3,721 geese (0.63 per respondent) across all three seasons. Therefore, an estimated 7,520 geese were killed but not checked, making the total estimated harvest 15,806 across the late seasons.

A total of 2,334 adult male heads and 2,250 adult female heads were measured across all three seasons. Mean skull length of harvested adult males (statewide) was 130.3mm (95% CI = 130.0 – 130.5mm), and the mean skull length of harvested adult females was 125.7mm (95% CI = 125.4 – 125.9mm). The estimated percent of giant Canada geese in the harvest was 89.1%. The 95% confidence interval for males was  $\pm 2.1\%$ , and for females,  $\pm 2.3\%$ . Statewide harvest across all three seasons is estimated to be 14,082 giant Canada geese and 1,724 interior Canada geese.

By region, only Terre Haute failed to reach 80% giants in each year, as well as across all three seasons (76.2%). All three other regions exceeded the minimum proportion of giants in the harvest to allow for operational status.

All three five-day segments (1-5, 6-10, and 11-15 February) reached the minimum of 80% giants in the harvest. In general, the proportion of giants in the harvest declined as the season continued. Only Terre Haute did not reach the 80% threshold in any of the three five-day segments.

Five hundred forty one banded Canada geese were reported shot in Indiana during the late seasons (USGS 2010). Of these, 351 were banded in Indiana, 117 were banded in other Mississippi Flyway states, and 70 were banded in Canada. Of the Canadian-banded birds, all but 4 were banded in Ontario (3 in Nunavut, 1 in Quebec). The Ontario birds were made up of 38 MVP and 28 giants. Multiplying these numbers by the “geese per band” of Moser (2010), 84.3% of the total February

season harvest was giants. Based on band returns, total harvest across all three seasons was 18,248 Canada geese.

### **Discussion and Recommendations**

Aging and sexing birds that have been shot, frozen, etc. can be difficult. Of the 8,286 birds checked, 120 were reported to the check stations as banded. Of these, 108 were correctly classified by age, and 89 (75%) were correctly classified by sex. Of the 30 that were misclassified, 10 were sexed as juveniles at the time of banding. Since it is easier to misclassify juveniles than adults, it is possible that these 10 young birds were sexed incorrectly during banding and the check stations were correct. However, that leaves at least 20 birds that were misclassified (17%). These misclassifications are likely a source of error in the current evaluation.

The 30 misclassified as to sex included 21 males sexed as females, and 9 females that were called males. Based on this, approximately 7.5% of the male skulls measured for this evaluation were actually females, and 17.5% of female skulls were actually male. Since females are smaller than males, the average skull length is smaller than the true mean for males and larger than the true mean for females. Also, since more males were mistaken for females, the female estimate is likely biased high to a greater degree than the male estimate is biased low. The method I used to average the results ameliorates some of these biases. However, it does not account for the greater number of males in the female sample than vice versa, and so is still likely biased high.

To further illustrate this complicated source of error, the average skull length for adult females across all three seasons was 125.7mm. When using this average, we get an estimate of 108% giants. The Trost et al. (1992) equation produces estimates > 100% if the harvest mean is sufficiently large. This could happen in multiple ways. The harvest could be made up of more Indiana birds than are accounted for in the reference collection mean, or average skull size may have increased since Moser and Rolley took their reference measurements. However, most of this anomaly is certainly generated by mis-sexed males that were included in the female dataset, which drives up the mean skull length and therefore the estimated proportion of the harvest made up of giant Canada geese. Indiana's harvest during this experiment was obviously not 100% giants. The truth lies somewhere between the two estimates, with the 78.6% generated using male skulls as a conservative lower boundary and 100% generated using female skulls as a liberal upper boundary. It seems obvious that the true harvest was over the 80% required for special seasons.

*Other Methods of Estimating Harvest:* It is possible to estimate harvest using a few different methods. The method upon which I have relied here (a combination of skull measurements and hunter survey results) depends on an accurate estimate of the number of birds killed but not checked. If many hunters did not accurately report this number, then the total harvest is underestimated.

Band returns can also be used to estimate harvest by subspecies, and in this case using band returns generates a comparable harvest estimate—15,806 using the hunter survey and 18,248 using band returns (15% higher using band returns). The estimate of *B. c. interior* in the harvest was 84.3%, only 4.8% lower than the estimate using morphometric analysis.

Finally, the USFWS estimates harvest using the Harvest Information Program (HIP). This method cannot be used to determine the subspecies of harvested birds, but the total harvest estimate is close to those derived from the other two methods. The hunter survey method estimate is 18.2% lower than the HIP estimate (13,156 for HIP across the 2007-08 and 2008-09 seasons, versus 11,131 for the hunter survey across the same period, Phelps 2009). However, HIP is designed to produce accurate estimates ( $\pm 10\%$ ) at the state level across entire hunting seasons (K. Richkus, USFWS, pers. comm.), so HIP is expected to be less accurate over shorter periods.

*Hunter Compliance:* In 2009 and 2010, the number of birds per hunter reported as not checked increased dramatically over 2008. While it could be that a higher percentage of birds were actually checked in 2008 than in subsequent years, it is also possible that fewer hunters reported accurately that they did not check birds in 2008, because of concerns that their answer would be used for enforcement purposes. Since no enforcement action was taken in 2008 based on survey responses, perhaps more hunters reported their numbers accurately in subsequent years. However, the accuracy of the 2008 numbers is supported by the very similar harvest estimate derived by using band returns. It is difficult to draw a conclusion, but I suspect a combination of both a lower percentage of checked birds and more accurate reporting of unchecked birds in 2009 and 2010.

Indiana will ask the Mississippi Flyway Council to recommend to the USFWS that the late season be granted operational status in July 2010, based on the results of this evaluation.

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